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09/528,282	03/17/2000	Yonezo Furuya	109A 2948	4121

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EXAMINER

SHAPIRO, JEFFERY A

ART UNIT	PAPER NUMBER
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3653

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/528,282

Applicant(s)

FURUYA, YONEZO

Examiner

Jeffrey A. Shapiro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 4/12/05.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 16-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 16-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 16 is objected to because of the following informalities: in line 12, the word "filed" appears to be "field". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 16-17, 19-23 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Strauts (US 5,630,494). Strauts discloses the coin inspection apparatus as follows.

- a. an exciting coil ((212), see figure 9 and col. 12, lines 34-65) arranged in the vicinity of one side of a coin passage;
- b. a receiving coil ((222, 224), see figure 9 and col. 12, lines 34-65) arranged in the vicinity of said one side of said coin passage so as to be electromagnetically coupled with said exciting coil;
- c. oscillation means (see col. 14, lines 26-34) for exciting and oscillating said exciting coil at a predetermined frequency to produce an electromagnetic field;

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- d. first detecting means (250) for detecting at least one of amplitude, frequency and phase of an oscillation voltage of said exciting coil (see col. 14, lines 48-53);
- e. second detecting means (256) for detecting an electromotive force signal generated in said receiving coil;
- f. discriminating means (see col. 15, lines 31-44, noting the microprocessor appears to be such a means) for discriminating authenticity of the thrown coin based on detection from said first and second detecting means;
- g. *discriminating authenticity based on a combination of an electromotive force signal detected by said receiving coil and amplitude, frequency or phase of an oscillation voltage of said exciting coil (see col. 14, lines 48-53 and col. 15, lines 3-30, example);*
- h. said predetermined frequency is set in accordance with material of the coin to be discriminated (see col. 15, lines 3-30);
- i. said discriminating means determines material of the thrown coins based on the amplitude of the oscillation voltage of said exciting coil (see col. 15, lines 31-44);
- j. said discriminating means samples said electromotive force signal in a *time* period, and performs a statistical process based on the sampled values to determine a feature of the thrown coin (see figure 12b, for

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example as well as col. 15, lines 4-16, noting that a "cycle" is construed as a time period);

k. two receiving coils having substantially identical characteristics and arranged in the vicinity of said one side of said coin passage so that said receiving coils are electromagnetically coupled with said exciting coil (see figures 9-11);

l. discriminating authenticity of the coin based upon at least one of amplitude, frequency and phase of oscillation voltage of said exciting coil, and an electromotive force signal *influenced by a reactive magnetic field caused by eddy currents induced on a surface of the coin when the coin passes through said electromagnetic field* and detected by said two receiving coils (see col. 14, lines 48-53 and col. 15, lines 31-44);

m. said first detecting means includes a first detector circuit (250) for outputting a direct voltage signal corresponding to the oscillation voltage of said exciting coil;

n. said exciting coil is arranged at a predetermined distance from said receiving coils so that a line connecting the center of magnetic poles of said exciting coil is substantially **parallel or perpendicular** with an extending direction of said coin passage, and two receiving coils are arranged above a coin rail provided with said coin passage so that a line connecting centers of said two receiving coils is substantially **parallel or**

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**perpendicular** with an extending direction of said coin passage (see figures 9-11);

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5, 16-17, 19-23 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Iwamoto et al (US 5,630,494) in view of Nagaraj (US 6,259,316 B1).

Iwamoto discloses the coin inspection apparatus as follows.

- a. an exciting coil ((11), see figures 10 and 13A) arranged in the vicinity of one side of a coin passage;
- b. a receiving coil ((12), see figures 10 and 13A) arranged in the vicinity of said one side of said coin passage so as to be electromagnetically coupled with said exciting coil;
- c. oscillation means (27) for exciting and oscillating said exciting coil at a predetermined frequency to produce an electromagnetic field;
- d. first detecting means ((27), see abstract and figure ) for detecting at least one of amplitude, frequency and phase of an oscillation voltage of

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said exciting coil (see col. 13, lines 40-50, which describes a phase difference being sampled);

- e. second detecting means ((26), see col. 13, lines 29-40) for detecting an electromotive force signal generated in said receiving coil; See also figure 27, illustrating first coil (11) and second coil (121 and 122), first detection means (27) and second detection means (261 or 262)
- f. discriminating means (31 or 46) for discriminating authenticity of the thrown coin based on detection from said first and second detecting means; (See figures 13A and 27);
- g. discriminating authenticity based on a combination of an electromotive force signal detected by said receiving coil and amplitude, frequency or phase of an oscillation voltage of said exciting coil (see figure 16, element (26) and figure 22 illustrating frequency graph);
- h. said predetermined frequency is set in accordance with material of the coin to be discriminated (see figures 19A-20B);
- i. said discriminating means determines material of the thrown coins based on the amplitude of the oscillation voltage of said exciting coil (see figure 18);
- j. said discriminating means samples said electromotive force signal in a *time* period, and performs a statistical process based on the sampled values to determine a feature of the thrown coin (see figures 28 and 53 and col. 28, lines 24-50, noting also that circuit (27) of figure 13A, for

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example, is mentioned as a "sampling pulse generating circuit", implying that statistical analysis is used to obtain raw data from the coil outputs);

k. two receiving coils having substantially identical characteristics and arranged in the vicinity of said one side of said coin passage so that said receiving coils are electromagnetically coupled with said exciting coil (see figures 10, 34, 46 and 48);

l. discriminating authenticity of the coin based upon at least one of amplitude, frequency and phase of oscillation voltage of said exciting coil, and an electromotive force signal influenced by a reactive magnetic field caused by eddy currents induced on a surface of the coin when the coin passes through said electromagnetic field *and* detected by said two receiving coils (see figure 2, figure 16, element (26) and figure 22 illustrating a frequency graph);

m. said first detecting means includes a first detector circuit (26, 261, 262, 263) for outputting a direct voltage signal corresponding to the oscillation voltage of said exciting coil;

n. said exciting coil is arranged at a predetermined distance from said receiving coils so that a line connecting the center of magnetic poles of said exciting coil is substantially **parallel or perpendicular** with an extending direction of said coin passage, and two receiving coils are arranged above a coin rail provided with said coin passage so that a line connecting centers of said two receiving coils is substantially **parallel or**



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**perpendicular** with an extending direction of said coin passage (see figures 41A-C, 59, 60);

Iwamoto does not expressly disclose that a differential amplifier is used. However, Nagaraj discloses that the buffer amplifier of figures 1-5 include differential amplifiers (M1 and M2). See Nagaraj, col. 1, lines 30-47.

Both Iwamoto and Nagaraj are considered to be analogous art because Iwamoto uses a buffer amplifier circuit and Nagaraj concerns a buffer circuit that has differential amplifiers.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have replaced Iwamoto's buffer amplifiers with those based on Nagaraj's teaching of utilizing differential amplifiers. See Nagaraj, col. 30-47.

The suggestion/motivation for doing so would have been to handle the high speeds of data obtained from many coins traveling past the coil sensors in a short amount of time. See Nagaraj, col. 1, lines 48-51.

6. Claims 18, 24 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strauts in view of Fougere (US 3,870,137).

Strauts discloses the system described above. Strauts does not expressly disclose, but Fougere discloses;

As described in Claims 18 and 27;

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o. said second detecting means comprises a bridge circuit ((520), see col. 7, lines 48-67 and col. 8, lines 1-24, (720), see col. 11, lines 48-67 and col. 1-48, and (1320), see col. 21, lines 1-30) including said two receiving coils, a different amplifier circuit for amplifying an alternating voltage signal outputted from said bridge circuit and outputting the amplified signal, and a second detector circuit for detecting and rectifying the alternating voltage signal from said differential amplifier circuit and converting the same into a direct voltage signal corresponding to the output of said bridge circuit (see figures 7, 11-13);

As described in Claims 6 and 24;

p. said coin passage (30) is formed so that a coin passing therethrough is inclined to said one side of said coin passage where said exciting coil and said receiving coils are arranged (see col. 4, lines 8-21);

Both Strauts and Fougere are analogous art because they both concern gathering sampled data sensed by a particular validation sensor and analysis of said data for judgment of the genuineness of said data.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the bridge circuits of Fougere in the validators of Strauts.

The suggestion/motivation would have been to balance the inputs and outputs of the amplifiers coming from the eddy current sensors so as to indicate a digital signal at

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one level when balanced or close to balanced and at another level at other times. See Fougere, col. 8, lines 11-49 and col. 9, lines 1-23.

It would also have been obvious to use a coin track that is slanted in the system of Strauts, as taught by Fougere.

The suggestion/motivation would have been to "cause the face of the coin to bear against the wall" of the coin passage. See Fougere, col. 4, lines 8-21.

Therefore, it would have been obvious to combine Strauts and Fougere in order to obtain the invention as described in Claims 6, 18, 24 and 27.

7. Claims 10, 15, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strauts in view of Laskowski et al (US 6,101,266).

Strauts discloses the system as described above. Strauts further discloses sampling data from said eddy current sensors at particular cycles/time intervals. See Strauts, col. 15, lines 4-44.

Strauts does not expressly disclose, but Laskowski discloses:

As described in Claims 10, 15 and 26;

q. said statistical process is performed by obtaining a coefficient of correlation of said sampled values with respect to a reference coin, and discriminating the thrown coin based on magnitude of said correlation coefficient; See Laskowski, col. 8, lines 47-67 and col. 9, lines 1-23.

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Both Strauts and Laskowski are analogous art because they both concern gathering sampled data sensed by a particular validation sensor and analysis of said data for judgment of the genuiness of said data.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the statistical methods of using correlation coefficients to analyze the data generated by the eddy current sensors of Strauts, as taught by Laskowski.

The suggestion/motivation would have been to compare and match a set of sampled data with a set of stored data from actual known coins of a particular denomination such that a higher correlation coefficient between the set of sampled data and a particular set of stored data will indicate the stored set that corresponds closest to the sampled set, thereby indicating the particular coin denomination and genuiness of the coin. See Laskowski, col. 8, lines 47-67 and col. 9, lines 1-23.

Therefore, it would have been obvious to combine Strauts and Laskowski in order to obtain the invention as described in Claims 10, 15 and 26.

### ***Response to Arguments***

8. Applicant's arguments with respect to Claims 1-5, 16-17, 19-23 and 25 have been considered but are moot in view of the new ground(s) of rejection.

See the Iwamoto rejection described above. Regarding Strauts, applicant asserts there is no differential amplifier. However, detector circuit (250) can be construed as a differential circuit because it detects the difference "VDIFF" between the two coils. Note also that VDIFF passes through buffer amplifier (252) which can be

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construed as a differential amplifier. See Strauts, col. 15, lines 3-16. Note also that electromotive force can inherently be obtained from the magnetic field as is any of amplitude, frequency and phase of the signals. Regarding Laskowski, the fact that banknotes and coins are different is immaterial since the teaching taken from Laskowski is the analysis of the discrimination data using statistical analysis.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey A. Shapiro whose telephone number is

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(571)272-6943. The examiner can normally be reached on Monday-Friday, 9:00 AM-5:00 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald P. Walsh can be reached on (571)272-6944. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jeffrey A. Shapiro  
Examiner  
Art Unit 3653

June 26, 2005



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